

Title (en)

METHOD AND ATOMIC FORCE MICROSCOPE FOR IMAGING SURFACES WITH ATOMIC RESOLUTION

Publication

EP 0223918 A3 19880727 (EN)

Application

EP 86110276 A 19860725

Priority

US 80212385 A 19851126

Abstract (en)

[origin: EP0223918A2] A sharp point (5) is brought so close to the surface of a sample (4) to be investigated that the forces occurring between the atoms at the apex of the point (5) and those at the surface cause a spring-like cantilever (7) to deflect. The cantilever (7) forms one electrode of a tunneling microscope, the other electrode being a sharp tip (8). The deflection of the cantilever (7) provokes a variation of the tunnel current, and that variation is used to generate a correction signal which can be employed to control the distance between said point (5) and the sample (4), in order, for example, to maintain the force between them constant as the point (5) is scanned across the surface of the sample (4) by means of an xyz-drive (3). In certain modes of operation, either the sample (4) or the cantilever (7) may be excited to oscillate in z-direction. If the oscillation is at the resonance frequency of the cantilever (7), the resolution is enhanced.

IPC 1-7

G01N 27/00; G01L 1/00; H01J 37/28

IPC 8 full level

G01B 7/34 (2006.01); **G01B 21/30** (2006.01); **G01N 13/12** (2006.01); **G01N 13/16** (2006.01); **G01N 37/00** (2006.01); **G01Q 20/00** (2010.01); **G01Q 60/24** (2010.01); **G12B 21/00** (2006.01); **G12B 21/08** (2006.01)

CPC (source: EP)

G01Q 20/00 (2013.01); **G01Q 60/38** (2013.01)

Citation (search report)

- [A] EP 0027517 A1 19810429 - IBM [US]
- [A] THE REVIEW OF SCIENTIFIC INSTRUMENTS, vol. 43, no. 7, July 1972, pages 999-1011, New York, US; R. YOUNG et al.: "The topografiner: an instrument for measuring surface microtopography"
- [A] THE REVIEW OF SCIENTIFIC INSTRUMENTS, vol. 37, no. 3, March 1966, pages 275-278, New York, US; R.D. YOUNG: "Field Emission Ultramicrometer"
- [XP] PHYSICAL REVIEW LETTERS, vol. 56, no. 9, 3rd March 1986, pages 930-933; G. BINNIG et al.: "Atomic force microscope"

Cited by

US5212987A; EP0596494A3; EP0650029A3; GB2238161A; US7483363B2; CN106996926A; DE19646120C2; EP0388640A3; EP0485202A3; EP0433604A3; US5051379A; DE3820518C1; EP0441311A3; US5144128A; EP0407460A4; US8160848B2; US6198299B1; US6838895B2; US7180317B2; US6744268B2

Designated contracting state (EPC)

BE CH DE FR GB IT LI NL SE

DOCDB simple family (publication)

EP 0223918 A2 19870603; **EP 0223918 A3 19880727**; **EP 0223918 B1 19901024**; BR 8605251 A 19870728; CA 1270132 A 19900612; DE 3675158 D1 19901129; JP H0754249 B2 19950607; JP S62130302 A 19870612

DOCDB simple family (application)

EP 86110276 A 19860725; BR 8605251 A 19861028; CA 519172 A 19860926; DE 3675158 T 19860725; JP 24333086 A 19861015